

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

|                                      |   |                         |
|--------------------------------------|---|-------------------------|
| In the Matter of                     | ) |                         |
|                                      | ) |                         |
| KUTV LICENSEE, LLC                   | ) | MB Docket No. 20- _____ |
|                                      | ) | RM - _____              |
| Petition for Rulemaking to Amend the | ) |                         |
| DTV Table of Allotments for          | ) |                         |
| Station KMYU(DT), St. George, UT     | ) |                         |
| (Facility ID No. 35822)              | ) |                         |

**PETITION FOR RULEMAKING**

KUTV LICENSEE, LLC, licensee of television station KMYU(DT), St. George, UT (Facility ID No. 35822) (“KMYU” or the “Station”), hereby requests that the Commission commence a rulemaking pursuant to Section 1.401 of the Commission’s rules<sup>1</sup> in order to amend the DTV Table of Allotments by allotting UHF Channel 21 to KMYU in lieu of VHF Channel 9 consistent with the technical parameters as set forth in the attached Engineering Statement.<sup>2</sup> As demonstrated herein, the proposed channel substitution for KMYU from VHF Channel 9 to UHF Channel 21 would allow KMYU to significantly improve its over-the-air service to the Station’s viewers in the St. George, UT market. As shown below, the proposed channel change from Channel 9 to Channel 21 would result in a substantial increase in signal receivability for KMYU’s core viewers, and enable viewers to receive the Station’s signal with a significantly smaller antenna.

The proposed channel substitution would serve the public interest because KMYU has had a long history of dealing with severe reception problems. The reception issues were

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<sup>1</sup> 47 C.F.R. § 1.401.

<sup>2</sup> See Engineering Statement of John E. Hidle, P.E., In Support of a Petition to Amend the Table of Allotments for KMYU, St. George, UT (“Engineering Statement”).

exacerbated by the analog to digital conversion. This is not surprising as the Commission has long recognized that “VHF channels have certain characteristics that have posed challenges for their use in providing digital television service,” including “propagation characteristics of these channels [that] allow undesired signals and noise to be receivable at relatively farther distances,” and the fact that “reception of VHF signals requires physically larger antennas that are generally not well suited to the mobile applications expected under flexible use, relative to UHF channels.”<sup>3</sup> The Commission has also stated that studies have found “large variability in the performance (especially intrinsic gain) of indoor antennas available to consumers, with most antennas receiving fairly well at UHF and the substantial majority not so well to very poor at high-VHF.”<sup>4</sup>

These sound conclusions by the Commission have proven to be absolutely correct and are entirely consistent with the experience of KMYU operating on VHF Channel 9. Indeed, KMYU has received numerous complaints from viewers unable to receive the Station’s over-the-air signal, despite being able to receive signals from other local stations. Permitting KMYU to operate on UHF Channel 21 instead of VHF Channel 9 will alleviate the Station’s reception issues and will improve service to local viewers. Importantly, the proposal will result in more effective building penetration for indoor antenna reception and will also greatly improve the Station’s ability to provide ATSC 3.0 service to homes, vehicles and portable devices, to the ultimate benefit of the Station’s viewers and the public interest in St. George, UT.

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<sup>3</sup> *Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, NPRM, 25 FCC Rcd 16498, 16511 ¶ 42 (2010) (“*VHF Improvements NPRM*”).

<sup>4</sup> *Id.* at 16512 ¶ 44. See also *Amendment of Parts 73 and 74 of the Commission’s Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations*, Second R&O, 25 FCC Rcd 10732, 10750 ¶ 37 (2011) (“As a result of the full power digital television transition, some full power stations on VHF channels have experienced reception problems and such problems have not been alleviated even by allowing these stations to operate with the maximum power permitted under the full power television rules.”).

As an initial matter, for the Station's signal to be received at all by viewers, it would require an antenna gain of at least 6 dB (according to planning factors) and an antenna elevated 30 feet above ground! As further evidence of why the requested channel change from VHF Channel 9 is absolutely necessary, attached are charts taken from the instruction manuals for Potomac Instruments Field Strength Meters, which are used to determine the actual physical size of the wavelengths of digital VHF and UHF channels. These charts are specifically utilized to adjust the length of the reference dipole antennas associated with each instrument according to the frequency being measured. As shown in the charts, the dipole antenna length for Channel 13, the shortest VHF antenna, would be **over two feet** for a portable device, and an antenna for Channel 9 would be even longer. An antenna of this size is unrealistic for use in a portable mobile device. In contrast, the charts indicate the dipole length for Channel 14, the longest UHF antenna, to be only **10.2 inches**, which is used in portable devices capable of UHF signal reception which are currently being manufactured. Consequently, the ability of broadcast television stations to use the groundbreaking new ATSC 3.0 technology, which will dramatically enhance the television viewing experience for mobile consumers, depends on those stations being able to broadcast on UHF channels. This fact alone should justify the requested channel change as being overwhelmingly in the public interest.

As shown in the attached Engineering Statement, the proposed migration of KMYU from Channel 9 to Channel 21 will be a favorable arrangement of allotments based on the enhanced signal levels that will be delivered to a large percentage of the population within the Station's "protected service area." For example: The percentage of population receiving a signal greater than 100 dBu is **0%** for Channel 9, while the percentage that is predicted to receive a signal greater than 100 dBu is **54.5%** for Channel 21, or **86,293** persons. The respective populations predicted for each channel and signal levels are shown in the Exhibits attached to

the Engineering Statement. As these population figures demonstrate, the proposed channel change from Channel 9 to Channel 21 would result in a substantial increase in signal receivability for KMYU's core viewers, without any predicted loss of coverage.<sup>5</sup> Consequently, the proposed move to Channel 21 would serve the public interest by giving St. George, UT viewers significantly improved access to KMYU's signal.

Now that Phase 10 has been completed and the repack is winding down, and the freeze on the filing of rulemaking petitions for channel changes has been lifted, grant of the instant Petition would have no impact on the Post-Transition Table of DTV Allotments or otherwise affect the analysis of repacking methodologies.<sup>6</sup> Indeed, the Media Bureau has already permitted full power, Class A, and low power stations to propose substitutions of their assigned channels as part of the post-auction transition.<sup>7</sup> Additionally, as shown in the attached Engineering Statement, KMYU's proposed move from Channel 9 to Channel 21 protects all operating and approved post-Auction facilities in accordance with the Commission's rules. Further, KMYU has confirmed with its vendors that they have the capacity to supply the antenna and transmitter equipment necessary for KMYU's proposed Channel 21 facility without

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<sup>5</sup> As the Bureau is aware, even where a proposed modification would result in some minimal service loss, the Commission will approve the proposed modification provided that it is "supported by a strong showing of countervailing public interest," such as offsetting service gains. See *Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, NPRM, 22 FCC Rcd 9478, 9493 ¶ 38 & n.70.

<sup>6</sup> See *Amendment of Section 73.622(i), Post-Transition Table of DTV Allotments, Station WNLO(TV), Buffalo, New York*, NPRM, MB Docket No. 19-118, DA 19-316 at ¶ 6 (MB April 23, 2019) (proposing to waive channel-substitution and contour extension freezes "because the underlying purpose of the freeze is not implicated" given that "the incentive auction and repacking have been completed"), *proposal adopted by Report and Order*, MB Docket No. 19-118, DA 19-553 (MB June 12, 2019). See also, *Media Bureau Lifts Freeze on the Filing of Television Station Minor Modification Applications and Rulemaking Petitions Effective Fifteen Days After Publication in the Federal Register*, Public Notice, DA 20-1269 (MB October 29, 2020).

<sup>7</sup> See *Incentive Auction Closing and Channel Reassignment Public Notice the Broadcast TV Incentive Auction Closes; Reverse Auction and Forward Auction Results Announced; Final TV Band Channel Assignments Announced; Post-Auction Deadlines Announced*, Public Notice, 32 FCC Rcd. 2786 ¶ 71 (2017); *Incentive Auction Task Force and Media Bureau Announce Post Incentive Auction Special Displacement Window April 10, 2018, Through May 15, 2018, And Make Location and Channel Data Available*, Public Notice, 33 FCC Rcd. 1234 ¶ 6 (IATF and MB 2018).



adversely impacting any other station's repack progress. KMYU's proposed channel substitution thus does not in any way obstruct the Commission's repacking process, making the instant Petition ripe for Media Bureau approval and grant.

Accordingly, the public interest would be best served by promptly granting KMYU's request to move from Channel 9 to Channel 21 with the specifications set forth in the Engineering Statement, so that St. George, UT-area viewers may benefit from substantially improved over-the-air broadcast television service as soon as possible, consistent with §73.622(i) of the Commission's Rules.

### **Conclusion**

For the foregoing reasons, the proposed amendment to the DTV Table of Allotments will clearly serve the public interest. Petitioner therefore respectfully requests that the DTV Table of Allotments be amended in accordance with the specifications set forth in the attached Engineering Statement.

Respectfully submitted,

**KUTV LICENSEE, LLC**

By: /s/ Paul A. Cicelski

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David Burns

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Washington, DC 20036

*Counsel to KUTV Licensee, LLC*

Dated: November 27, 2020



**STATEMENT OF JOHN E. HIDLE, P.E.  
IN SUPPORT OF A PETITION TO AMEND  
THE DIGITAL TELEVISION TABLE OF ALLOTMENTS  
KMYU - ST. GEORGE, UTAH  
DTV - CH. 21 - 250 kW - 43 m HAAT**

Prepared for: KUTV LICENSEE, LLC

I am a Consulting Engineer, an employee in the firm of Carl T. Jones Corporation, with offices located in Springfield, Virginia. My education and experience are a matter of record with the Federal Communications Commission. I am a Licensed Professional Engineer in the Commonwealth of Virginia, No. 7418, and in New York State, No. 63418.

**GENERAL**

This office has been authorized by KUTV LICENSEE, LLC, licensee of KMYU channel 9, licensed to St. George, Utah, to prepare this statement in support of a Petition to Amend the Digital Television (DTV) Post Repack Table of Allotments, §73.622(i) of the FCC Rules. The petitioner requests that §73.622(i) of the Commission's Rules be modified to change KMYU's allotted channel. DTV channel 9 is currently specified in the Digital Television Table of Allotments for KMYU. The petitioner requests herein to substitute DTV channel 21 for DTV channel 9. The proposed arrangement of allotments is made to enhance potential viewers' ability to more easily receive the broadcast signal of KMYU. For example, when a signal strength of 80 dBu is compared, channel 9 provides a potential viewer population of 86,628 persons while channel 21 provides a population of 109,570 persons. Further, comparing a signal strength of 60 dBu channel 9 equals 127,709 while channel 21 equals 137,365. A signal level greater than 100 dBu provides the most dramatic comparison. For a predicted channel 9 signal greater than 100 dBu the

predicted population is zero while the channel 21 predicted greater than 100 dBu population is 86,293 persons. Additionally the UHF channel 21 requires a significantly smaller receiving antenna approximately one-third the size of an equivalent antenna for channel 9. This smaller antenna size by one-third and the >100 dBu signal level population of more than 86,000 persons bodes well for changing from channel 9 to UHF channel 21, especially when the ATSC 3.0 DTV standard is considered.

Even so, serious propagation problems associated with digital television broadcast (DTV) use of high-VHF television channels (7-13) remain. These are also well documented, both before and especially after the initial digital transition on June 12, 2009. These propagation and reception problems for channels 7-13 have been severe enough for the FCC to have, in Zone I where the ERP limit for channels 7-13 is 30 kW at 305 meters HAAT, granted a construction permit for channel 7 with an ERP of 34 kW at 500 meters HAAT. The Zone I ERP Limit for high-VHF channels at 500 meters HAAT is 5.8 kW. 34 kW is more than 5 times the zone I limit. And yet when ATSC 3.0 is considered the remaining problems continue to frustrate DTV broadcasters that use VHF channels, and many of those station still struggle with propagation problems and the subsequent viewer complaints. This proposal seeks to remedy this well known systemic problem in this instance and to provide viewers with a significant improvement in reception capability.

#### **EXPLANATION OF REASON FOR REQUEST**

KMYU's licensee has determined that the proposed migration from channel 9 to channel 21 will be a favorable arrangement of allotments based on the enhanced signal levels that will be delivered to a majority of the population within the station's "protected service area". For example: The population receiving a signal greater than 100 dBu is zero for channel 9 while the population predicted to receive a signal greater than 100 dBu

is 86,293 for channel 21. The populations predicted for each channel and signal levels are shown in the attached map exhibits. Note that a change to channel 21 results in a predicted increase of about 8,000 persons in the overall population. The licensee believes that changing KMYU to operate on channel 21 will solve most, if not all of its current reception problems.

### **ATSC 3.0 PERMISSIBLE DTV STANDARD**

A more immediate concern is the future migration to the ATSC 3.0 permissible standard for over-the-air DTV and the multitude of potential benefits expected to accrue. Probably the most anticipated benefit is the ability to reach portable and mobile devices that have become the essence of the ubiquitous smart-phone culture. However, these devices must be small to fit the culture. Therein lies the intractable problem for VHF DTV stations. Channel 9, for example, has a wavelength of 5.204 feet. A simple half-wave dipole antenna, used as a reference with 0 dB gain, must be 2.60 feet long. The DTV planning factors set forth in the Sixth Report and Order (FCC 97-115) call for an antenna with 6 dB of gain elevated to 30 feet above the ground to just barely receive a signal at a strength of 36 dBu. An antenna for channel 9 with 6 dB of gain would measure 2.60 feet wide and at least 10 to 12 feet long. Obviously the required size of antennas for VHF channels precludes their use in the smart-phone culture. Therefore KMYU on channel 9 will likely be precluded from participation in ATSC 3.0 serving the portable and mobile users of these services. KMYU's licensee has heretofore been unable to consider a truly effective solution to its reception problems, and sees no viable solution to the portable, mobile problem while broadcasting on its VHF channel 9, until now. KMYU's licensee herein seeks an effective solution: change to a UHF channel.

KMYU's licensee has determined that the proposed migration to channel 21 will

be a favorable arrangement of allotments based on the enhanced signal levels that will be delivered to a majority of the population within the station's "protected service area". As previously noted the population receiving a signal greater than 100 dBu is zero for channel 9, while the population that is predicted to receive a signal greater than 100 dBu is 86,293 persons for channel 21. The higher signal levels provided by use of channel 21 will enable an ease of reception for mobile and portable devices users, notably the smartphone set. The populations predicted for each channel and signal levels are shown in the attached map exhibits. Please note there is a predicted population gain of 8,000 persons for KMYU on channel 21 compared to channel 9.

## **TECHNICAL STUDY**

An engineering study of all pertinent allotments, assignments, applications, construction permits and DTV licenses reveals that DTV channel 21 can be allotted to St. George, St. George in lieu of channel 9, and meet all of the Commission's interference criteria. The allotment reference coordinates for DTV channel 21 at St. George, Utah are: 37 03' 48.0" N.L. and 113 34' 26.0" W.L.<sup>1</sup> The St. George allotment reference site meets the allotment standards in §73.616(b); the requirements set forth in §73.616(f); the requirements set forth in §73.623(e), the requirement set forth in §73.623(f), and the principal community coverage requirements set forth in §73.625(a).

The petitioner proposes to install a new Dielectric model TFU-21EST/VP-R O4 non-directional antenna for channel 21 at KMYU's current centerline height above mean sea level (AMSL) of 965.0 meters and 43 meters above average terrain. The proposed

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<sup>1</sup> The channel 21 DTV allotment reference coordinates are the same as the DTV channel 9 allotment reference coordinates (as defined in Section 73.622(i) of the FCC Rules) of the petitioner's licensed KMYU, St. George, Utah tower site. License BLCDT-20021031ABG (See FCC tower registration number 1053312 ).

changes include the new non-directional antenna, an increase in ERP to 250 kW and a change from channel 9 to channel 21, The coverage area and population predicted to be served by KMYU are increased. All other station parameters are to remain unchanged.

## **ALLOCATION CONSIDERATIONS**

### ***Post-Transition DTV Considerations***

A study was performed, using the FCC's software, *tvstudy* v2.2.5, to determine if the instant petition to amend the post-transition Table is predicted to cause new prohibited interference to DTV stations, construction permits or DTV allotments. Results of the study indicate that the instant petition is predicted to cause no new interference greater than 0.5% to the populations served by any full-power DTV station, construction permit or allotment. See Appendix B. These results comply with the 0.5% limit for new post-repack interference set forth in §73.616(e) of the Commission's Rules.

### ***International DTV Considerations***

The KMYU site is located more than 1,300 kilometers from the nearest point on the US-Canadian border and 494.1 kilometers from the nearest point on the US-Mexican border. Therefore no international coordination is required.

### ***Class A Television Allocation Considerations***

As required in Section 73.616(f) of the FCC's Rules, the study results in Appendix B shows no Class A station predicted to be affected by the re-allotment of KMYU.

### ***Land Mobile and FM radio Considerations***

The *tvstudy* results found no Land Mobile violations for this site, and the site is deemed OK toward AM radio stations.

## **SUMMARY**

It is submitted that the instant Petition to Amend the DTV Table of Allotments to substitute DTV channel 21 for DTV channel 9 in St. George, St. George, as described herein, complies with the Rules, Regulations and relevant Policies of the Federal Communications Commission. This statement was prepared by me, or under my direct supervision, and its contents are believed to be true and correct to the best of my knowledge and belief.

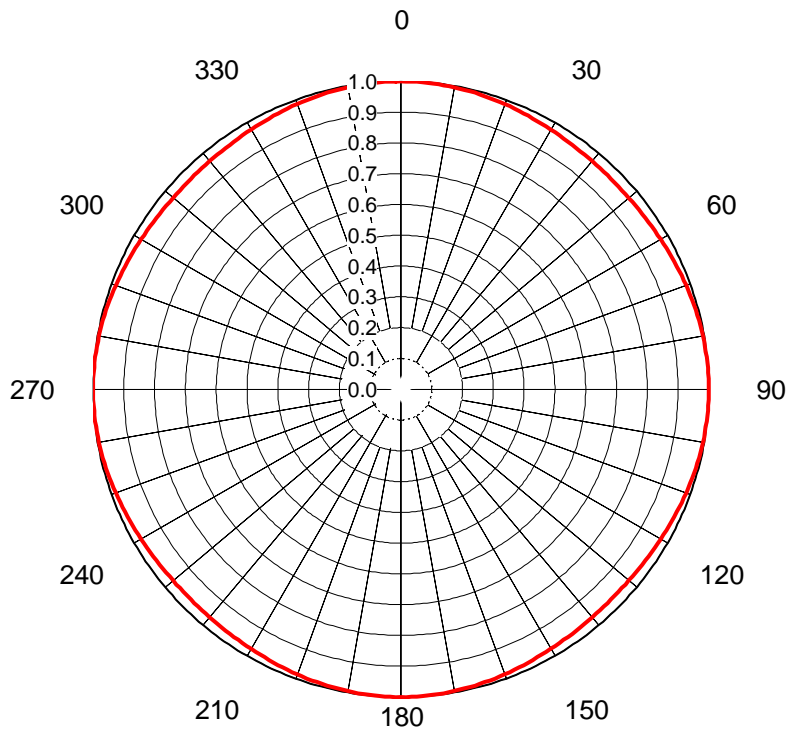
DATED: November 22, 2020



## AZIMUTH PATTERN Horizontal Polarization

In Free Space

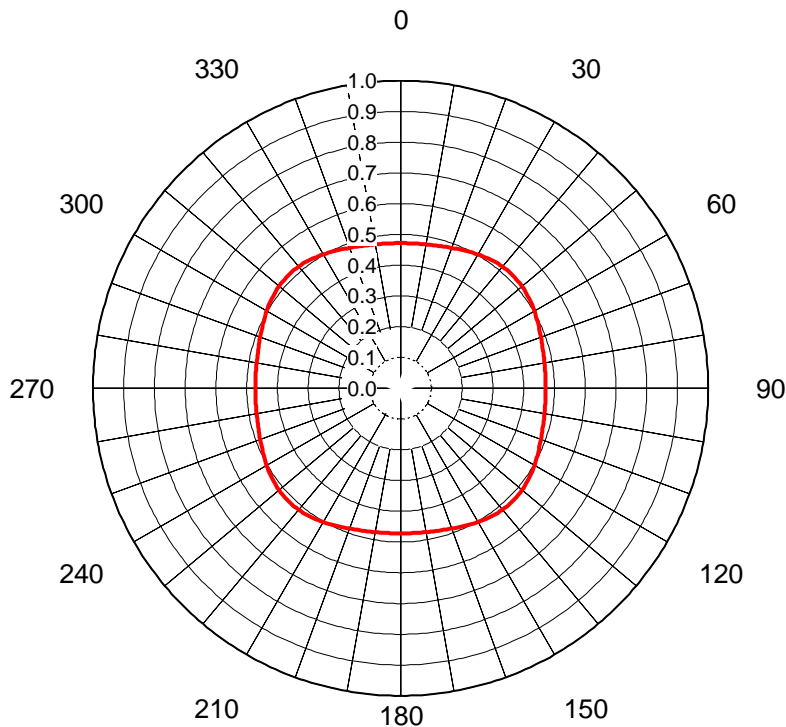
Proposal No. **C-71641**  
Date **9-Nov-20**  
Call Letters **KMYU**  
Channel **21**  
Frequency **515 MHz**  
Antenna Type **TFU-21EST/VP-R 04**  
Gain **1.04 (0.15dB)**  
Circularity **+/- 1.0 dB**



| Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value |
|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| 0   | 1.000 | 36  | 0.969 | 72  | 0.988 | 108 | 0.988 | 144 | 0.969 | 180 | 1.000 | 216 | 0.969 | 252 | 0.988 | 288 | 0.988 | 324 | 0.969 |
| 1   | 1.000 | 37  | 0.968 | 73  | 0.989 | 109 | 0.987 | 145 | 0.970 | 181 | 1.000 | 217 | 0.968 | 253 | 0.989 | 289 | 0.987 | 325 | 0.970 |
| 2   | 1.000 | 38  | 0.968 | 74  | 0.990 | 110 | 0.986 | 146 | 0.970 | 182 | 1.000 | 218 | 0.968 | 254 | 0.990 | 290 | 0.986 | 326 | 0.970 |
| 3   | 1.000 | 39  | 0.967 | 75  | 0.991 | 111 | 0.985 | 147 | 0.971 | 183 | 1.000 | 219 | 0.967 | 255 | 0.991 | 291 | 0.985 | 327 | 0.971 |
| 4   | 0.999 | 40  | 0.967 | 76  | 0.992 | 112 | 0.983 | 148 | 0.972 | 184 | 0.999 | 220 | 0.967 | 256 | 0.992 | 292 | 0.983 | 328 | 0.972 |
| 5   | 0.999 | 41  | 0.966 | 77  | 0.993 | 113 | 0.982 | 149 | 0.973 | 185 | 0.999 | 221 | 0.966 | 257 | 0.993 | 293 | 0.982 | 329 | 0.973 |
| 6   | 0.998 | 42  | 0.966 | 78  | 0.994 | 114 | 0.981 | 150 | 0.974 | 186 | 0.998 | 222 | 0.966 | 258 | 0.994 | 294 | 0.981 | 330 | 0.974 |
| 7   | 0.998 | 43  | 0.966 | 79  | 0.995 | 115 | 0.980 | 151 | 0.975 | 187 | 0.998 | 223 | 0.966 | 259 | 0.995 | 295 | 0.980 | 331 | 0.975 |
| 8   | 0.997 | 44  | 0.966 | 80  | 0.996 | 116 | 0.979 | 152 | 0.976 | 188 | 0.997 | 224 | 0.966 | 260 | 0.996 | 296 | 0.979 | 332 | 0.976 |
| 9   | 0.997 | 45  | 0.966 | 81  | 0.997 | 117 | 0.977 | 153 | 0.977 | 189 | 0.997 | 225 | 0.966 | 261 | 0.997 | 297 | 0.977 | 333 | 0.977 |
| 10  | 0.996 | 46  | 0.966 | 82  | 0.997 | 118 | 0.976 | 154 | 0.979 | 190 | 0.996 | 226 | 0.966 | 262 | 0.997 | 298 | 0.976 | 334 | 0.979 |
| 11  | 0.995 | 47  | 0.966 | 83  | 0.998 | 119 | 0.975 | 155 | 0.980 | 191 | 0.995 | 227 | 0.966 | 263 | 0.998 | 299 | 0.975 | 335 | 0.980 |
| 12  | 0.994 | 48  | 0.966 | 84  | 0.998 | 120 | 0.974 | 156 | 0.981 | 192 | 0.994 | 228 | 0.966 | 264 | 0.998 | 300 | 0.974 | 336 | 0.981 |
| 13  | 0.993 | 49  | 0.966 | 85  | 0.999 | 121 | 0.973 | 157 | 0.982 | 193 | 0.993 | 229 | 0.966 | 265 | 0.999 | 301 | 0.973 | 337 | 0.982 |
| 14  | 0.992 | 50  | 0.967 | 86  | 0.999 | 122 | 0.972 | 158 | 0.983 | 194 | 0.992 | 230 | 0.967 | 266 | 0.999 | 302 | 0.972 | 338 | 0.983 |
| 15  | 0.991 | 51  | 0.967 | 87  | 1.000 | 123 | 0.971 | 159 | 0.985 | 195 | 0.991 | 231 | 0.967 | 267 | 1.000 | 303 | 0.971 | 339 | 0.985 |
| 16  | 0.990 | 52  | 0.968 | 88  | 1.000 | 124 | 0.970 | 160 | 0.986 | 196 | 0.990 | 232 | 0.968 | 268 | 1.000 | 304 | 0.970 | 340 | 0.986 |
| 17  | 0.989 | 53  | 0.968 | 89  | 1.000 | 125 | 0.970 | 161 | 0.987 | 197 | 0.989 | 233 | 0.968 | 269 | 1.000 | 305 | 0.970 | 341 | 0.987 |
| 18  | 0.988 | 54  | 0.969 | 90  | 1.000 | 126 | 0.969 | 162 | 0.988 | 198 | 0.988 | 234 | 0.969 | 270 | 1.000 | 306 | 0.969 | 342 | 0.988 |
| 19  | 0.987 | 55  | 0.970 | 91  | 1.000 | 127 | 0.968 | 163 | 0.989 | 199 | 0.987 | 235 | 0.970 | 271 | 1.000 | 307 | 0.968 | 343 | 0.989 |
| 20  | 0.986 | 56  | 0.970 | 92  | 1.000 | 128 | 0.968 | 164 | 0.990 | 200 | 0.986 | 236 | 0.970 | 272 | 1.000 | 308 | 0.968 | 344 | 0.990 |
| 21  | 0.985 | 57  | 0.971 | 93  | 1.000 | 129 | 0.967 | 165 | 0.991 | 201 | 0.985 | 237 | 0.971 | 273 | 1.000 | 309 | 0.967 | 345 | 0.991 |
| 22  | 0.983 | 58  | 0.972 | 94  | 0.999 | 130 | 0.967 | 166 | 0.992 | 202 | 0.983 | 238 | 0.972 | 274 | 0.999 | 310 | 0.967 | 346 | 0.992 |
| 23  | 0.982 | 59  | 0.973 | 95  | 0.999 | 131 | 0.966 | 167 | 0.993 | 203 | 0.982 | 239 | 0.973 | 275 | 0.999 | 311 | 0.966 | 347 | 0.993 |
| 24  | 0.981 | 60  | 0.974 | 96  | 0.998 | 132 | 0.966 | 168 | 0.994 | 204 | 0.981 | 240 | 0.974 | 276 | 0.998 | 312 | 0.966 | 348 | 0.994 |
| 25  | 0.980 | 61  | 0.975 | 97  | 0.998 | 133 | 0.966 | 169 | 0.995 | 205 | 0.980 | 241 | 0.975 | 277 | 0.998 | 313 | 0.966 | 349 | 0.995 |
| 26  | 0.979 | 62  | 0.976 | 98  | 0.997 | 134 | 0.966 | 170 | 0.996 | 206 | 0.979 | 242 | 0.976 | 278 | 0.997 | 314 | 0.966 | 350 | 0.996 |
| 27  | 0.977 | 63  | 0.977 | 99  | 0.997 | 135 | 0.966 | 171 | 0.997 | 207 | 0.977 | 243 | 0.977 | 279 | 0.997 | 315 | 0.966 | 351 | 0.997 |
| 28  | 0.976 | 64  | 0.979 | 100 | 0.996 | 136 | 0.966 | 172 | 0.997 | 208 | 0.976 | 244 | 0.979 | 280 | 0.996 | 316 | 0.966 | 352 | 0.997 |
| 29  | 0.975 | 65  | 0.980 | 101 | 0.995 | 137 | 0.966 | 173 | 0.998 | 209 | 0.975 | 245 | 0.980 | 281 | 0.995 | 317 | 0.966 | 353 | 0.998 |
| 30  | 0.974 | 66  | 0.981 | 102 | 0.994 | 138 | 0.966 | 174 | 0.998 | 210 | 0.974 | 246 | 0.981 | 282 | 0.994 | 318 | 0.966 | 354 | 0.998 |
| 31  | 0.973 | 67  | 0.982 | 103 | 0.993 | 139 | 0.966 | 175 | 0.999 | 211 | 0.973 | 247 | 0.982 | 283 | 0.993 | 319 | 0.966 | 355 | 0.999 |
| 32  | 0.972 | 68  | 0.983 | 104 | 0.992 | 140 | 0.967 | 176 | 0.999 | 212 | 0.972 | 248 | 0.983 | 284 | 0.992 | 320 | 0.967 | 356 | 0.999 |
| 33  | 0.971 | 69  | 0.985 | 105 | 0.991 | 141 | 0.967 | 177 | 1.000 | 213 | 0.971 | 249 | 0.985 | 285 | 0.991 | 321 | 0.967 | 357 | 1.000 |
| 34  | 0.970 | 70  | 0.986 | 106 | 0.990 | 142 | 0.968 | 178 | 1.000 | 214 | 0.970 | 250 | 0.986 | 286 | 0.990 | 322 | 0.968 | 358 | 1.000 |
| 35  | 0.970 | 71  | 0.987 | 107 | 0.989 | 143 | 0.968 | 179 | 1.000 | 215 | 0.970 | 251 | 0.987 | 287 | 0.989 | 323 | 0.968 | 359 | 1.000 |

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## AZIMUTH PATTERN Vertical Polarization

In Free Space

Proposal No. **C-71641**  
 Date **9-Nov-20**  
 Call Letters **KMYU**  
 Channel **21**  
 Frequency **515 MHz**  
 Antenna Type **TFU-21EST/VP-R O4**  
 Gain **1.11 (0.44dB)**  
 Calculated  
 Circularity **+/- 1.0 dB**

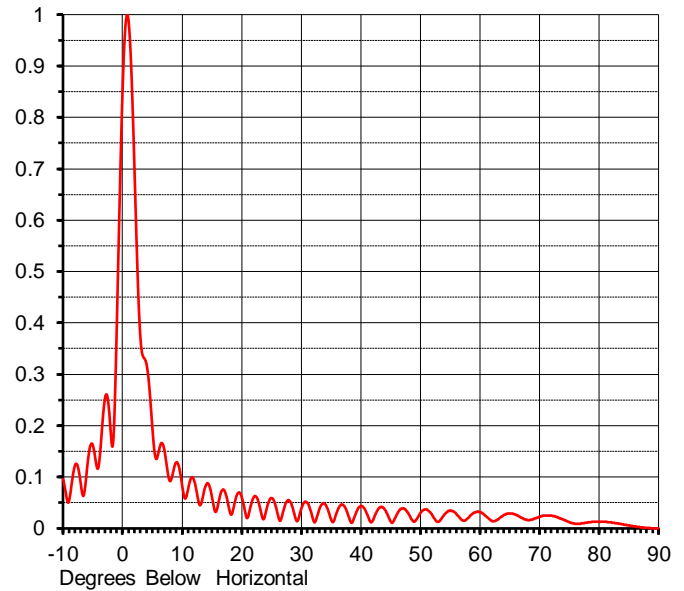
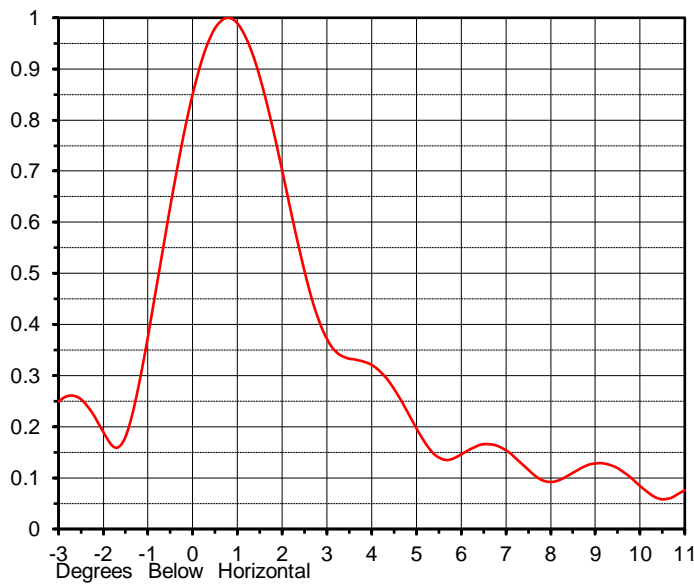
| Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value | Deg | Value |
|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| 0   | 0.472 | 36  | 0.512 | 72  | 0.483 | 108 | 0.483 | 144 | 0.512 | 180 | 0.472 | 216 | 0.512 | 252 | 0.483 | 288 | 0.483 |
| 1   | 0.472 | 37  | 0.513 | 73  | 0.482 | 109 | 0.484 | 145 | 0.510 | 181 | 0.472 | 217 | 0.513 | 253 | 0.482 | 289 | 0.484 |
| 2   | 0.472 | 38  | 0.514 | 74  | 0.480 | 110 | 0.486 | 146 | 0.509 | 182 | 0.472 | 218 | 0.514 | 254 | 0.480 | 290 | 0.486 |
| 3   | 0.472 | 39  | 0.515 | 75  | 0.479 | 111 | 0.487 | 147 | 0.507 | 183 | 0.472 | 219 | 0.515 | 255 | 0.479 | 291 | 0.487 |
| 4   | 0.472 | 40  | 0.516 | 76  | 0.478 | 112 | 0.489 | 148 | 0.506 | 184 | 0.472 | 220 | 0.516 | 256 | 0.478 | 292 | 0.489 |
| 5   | 0.473 | 41  | 0.516 | 77  | 0.477 | 113 | 0.490 | 149 | 0.504 | 185 | 0.473 | 221 | 0.516 | 257 | 0.477 | 293 | 0.490 |
| 6   | 0.473 | 42  | 0.517 | 78  | 0.476 | 114 | 0.492 | 150 | 0.502 | 186 | 0.473 | 222 | 0.517 | 258 | 0.476 | 294 | 0.492 |
| 7   | 0.473 | 43  | 0.517 | 79  | 0.476 | 115 | 0.494 | 151 | 0.501 | 187 | 0.473 | 223 | 0.517 | 259 | 0.476 | 295 | 0.494 |
| 8   | 0.474 | 44  | 0.518 | 80  | 0.475 | 116 | 0.495 | 152 | 0.499 | 188 | 0.474 | 224 | 0.518 | 260 | 0.475 | 296 | 0.495 |
| 9   | 0.474 | 45  | 0.518 | 81  | 0.474 | 117 | 0.497 | 153 | 0.497 | 189 | 0.474 | 225 | 0.518 | 261 | 0.474 | 297 | 0.497 |
| 10  | 0.475 | 46  | 0.518 | 82  | 0.474 | 118 | 0.499 | 154 | 0.495 | 190 | 0.475 | 226 | 0.518 | 262 | 0.474 | 298 | 0.499 |
| 11  | 0.476 | 47  | 0.517 | 83  | 0.473 | 119 | 0.501 | 155 | 0.494 | 191 | 0.476 | 227 | 0.517 | 263 | 0.473 | 299 | 0.501 |
| 12  | 0.476 | 48  | 0.517 | 84  | 0.473 | 120 | 0.502 | 156 | 0.492 | 192 | 0.476 | 228 | 0.517 | 264 | 0.473 | 300 | 0.502 |
| 13  | 0.477 | 49  | 0.516 | 85  | 0.473 | 121 | 0.504 | 157 | 0.490 | 193 | 0.477 | 229 | 0.516 | 265 | 0.473 | 301 | 0.504 |
| 14  | 0.478 | 50  | 0.516 | 86  | 0.472 | 122 | 0.506 | 158 | 0.489 | 194 | 0.478 | 230 | 0.516 | 266 | 0.472 | 302 | 0.506 |
| 15  | 0.479 | 51  | 0.515 | 87  | 0.472 | 123 | 0.507 | 159 | 0.487 | 195 | 0.479 | 231 | 0.515 | 267 | 0.472 | 303 | 0.507 |
| 16  | 0.480 | 52  | 0.514 | 88  | 0.472 | 124 | 0.509 | 160 | 0.486 | 196 | 0.480 | 232 | 0.514 | 268 | 0.472 | 304 | 0.509 |
| 17  | 0.482 | 53  | 0.513 | 89  | 0.472 | 125 | 0.510 | 161 | 0.484 | 197 | 0.482 | 233 | 0.513 | 269 | 0.472 | 305 | 0.510 |
| 18  | 0.483 | 54  | 0.512 | 90  | 0.472 | 126 | 0.512 | 162 | 0.483 | 198 | 0.483 | 234 | 0.512 | 270 | 0.472 | 306 | 0.512 |
| 19  | 0.484 | 55  | 0.510 | 91  | 0.472 | 127 | 0.513 | 163 | 0.482 | 199 | 0.484 | 235 | 0.510 | 271 | 0.472 | 307 | 0.513 |
| 20  | 0.486 | 56  | 0.509 | 92  | 0.472 | 128 | 0.514 | 164 | 0.480 | 200 | 0.486 | 236 | 0.509 | 272 | 0.472 | 308 | 0.514 |
| 21  | 0.487 | 57  | 0.507 | 93  | 0.472 | 129 | 0.515 | 165 | 0.479 | 201 | 0.487 | 237 | 0.507 | 273 | 0.472 | 309 | 0.515 |
| 22  | 0.489 | 58  | 0.506 | 94  | 0.472 | 130 | 0.516 | 166 | 0.478 | 202 | 0.489 | 238 | 0.506 | 274 | 0.472 | 310 | 0.516 |
| 23  | 0.490 | 59  | 0.504 | 95  | 0.473 | 131 | 0.516 | 167 | 0.477 | 203 | 0.490 | 239 | 0.504 | 275 | 0.473 | 311 | 0.516 |
| 24  | 0.492 | 60  | 0.502 | 96  | 0.473 | 132 | 0.517 | 168 | 0.476 | 204 | 0.492 | 240 | 0.502 | 276 | 0.473 | 312 | 0.517 |
| 25  | 0.494 | 61  | 0.501 | 97  | 0.473 | 133 | 0.517 | 169 | 0.476 | 205 | 0.494 | 241 | 0.501 | 277 | 0.473 | 313 | 0.517 |
| 26  | 0.495 | 62  | 0.499 | 98  | 0.474 | 134 | 0.518 | 170 | 0.475 | 206 | 0.495 | 242 | 0.499 | 278 | 0.474 | 314 | 0.518 |
| 27  | 0.497 | 63  | 0.497 | 99  | 0.474 | 135 | 0.518 | 171 | 0.474 | 207 | 0.497 | 243 | 0.497 | 279 | 0.474 | 315 | 0.518 |
| 28  | 0.499 | 64  | 0.495 | 100 | 0.475 | 136 | 0.518 | 172 | 0.474 | 208 | 0.499 | 244 | 0.495 | 280 | 0.475 | 316 | 0.518 |
| 29  | 0.501 | 65  | 0.494 | 101 | 0.476 | 137 | 0.517 | 173 | 0.473 | 209 | 0.501 | 245 | 0.494 | 281 | 0.476 | 317 | 0.517 |
| 30  | 0.502 | 66  | 0.492 | 102 | 0.476 | 138 | 0.517 | 174 | 0.473 | 210 | 0.502 | 246 | 0.492 | 282 | 0.476 | 318 | 0.517 |
| 31  | 0.504 | 67  | 0.490 | 103 | 0.477 | 139 | 0.516 | 175 | 0.473 | 211 | 0.504 | 247 | 0.490 | 283 | 0.477 | 319 | 0.516 |
| 32  | 0.506 | 68  | 0.489 | 104 | 0.478 | 140 | 0.516 | 176 | 0.472 | 212 | 0.506 | 248 | 0.489 | 284 | 0.478 | 320 | 0.516 |
| 33  | 0.507 | 69  | 0.487 | 105 | 0.479 | 141 | 0.515 | 177 | 0.472 | 213 | 0.507 | 249 | 0.487 | 285 | 0.479 | 321 | 0.515 |
| 34  | 0.509 | 70  | 0.486 | 106 | 0.480 | 142 | 0.514 | 178 | 0.472 | 214 | 0.509 | 250 | 0.486 | 286 | 0.480 | 322 | 0.514 |
| 35  | 0.510 | 71  | 0.484 | 107 | 0.482 | 143 | 0.513 | 179 | 0.472 | 215 | 0.510 | 251 | 0.484 | 287 | 0.482 | 323 | 0.513 |
|     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |

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## ELEVATION PATTERN

Proposal No. **C-71641**  
 Date **9-Nov-20**  
 Call Letters **KMYU**  
 Channel **21**  
 Frequency **515 MHz**  
 Antenna Type **TFU-21EST/VP-R 04**

RMS Directivity at Main Lobe **21.5 ( 13.32 dB )**  
 RMS Directivity at Horizontal **15.6 ( 11.93 dB )**  
 Beam Tilt **0.80 deg**  
 Pattern Number **080**  
**Calculated**

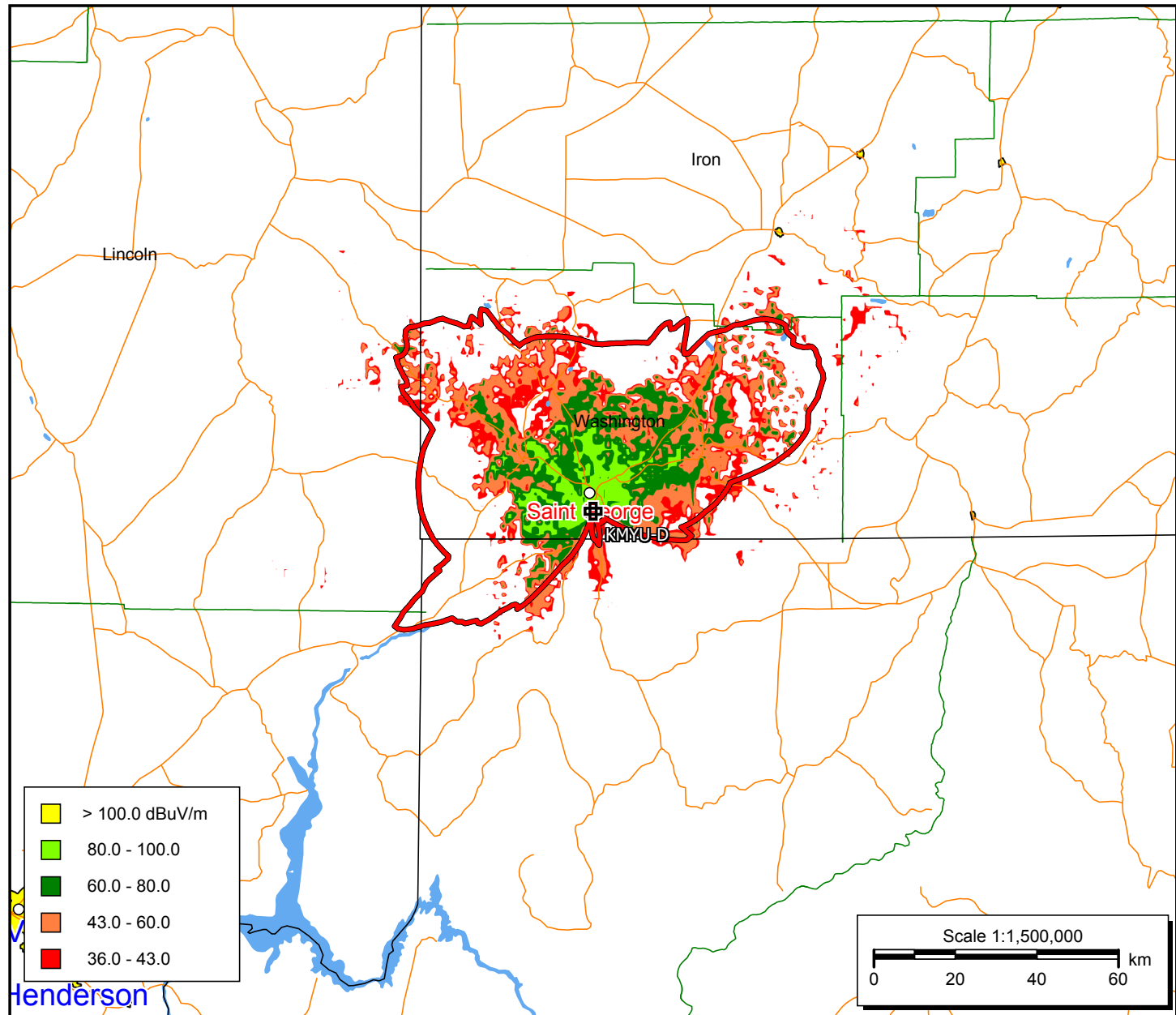


| Angle | Field | Angle | Field | Angle | Field | Angle | Field | Angle | Field |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| -10.0 | 0.096 | 10.0  | 0.084 | 30.0  | 0.038 | 50.0  | 0.030 | 70.0  | 0.023 |
| -9.0  | 0.053 | 11.0  | 0.076 | 31.0  | 0.050 | 51.0  | 0.037 | 71.0  | 0.025 |
| -8.0  | 0.122 | 12.0  | 0.094 | 32.0  | 0.017 | 52.0  | 0.026 | 72.0  | 0.025 |
| -7.0  | 0.086 | 13.0  | 0.045 | 33.0  | 0.036 | 53.0  | 0.013 | 73.0  | 0.022 |
| -6.0  | 0.112 | 14.0  | 0.084 | 34.0  | 0.047 | 54.0  | 0.026 | 74.0  | 0.017 |
| -5.0  | 0.162 | 15.0  | 0.062 | 35.0  | 0.018 | 55.0  | 0.035 | 75.0  | 0.012 |
| -4.0  | 0.122 | 16.0  | 0.044 | 36.0  | 0.032 | 56.0  | 0.029 | 76.0  | 0.009 |
| -3.0  | 0.249 | 17.0  | 0.075 | 37.0  | 0.046 | 57.0  | 0.016 | 77.0  | 0.010 |
| -2.0  | 0.190 | 18.0  | 0.033 | 38.0  | 0.022 | 58.0  | 0.020 | 78.0  | 0.011 |
| -1.0  | 0.377 | 19.0  | 0.058 | 39.0  | 0.024 | 59.0  | 0.030 | 79.0  | 0.013 |
| 0.0   | 0.851 | 20.0  | 0.061 | 40.0  | 0.044 | 60.0  | 0.032 | 80.0  | 0.013 |
| 1.0   | 0.989 | 21.0  | 0.021 | 41.0  | 0.029 | 61.0  | 0.024 | 81.0  | 0.013 |
| 2.0   | 0.701 | 22.0  | 0.060 | 42.0  | 0.015 | 62.0  | 0.015 | 82.0  | 0.012 |
| 3.0   | 0.372 | 23.0  | 0.044 | 43.0  | 0.039 | 63.0  | 0.017 | 83.0  | 0.010 |
| 4.0   | 0.321 | 24.0  | 0.029 | 44.0  | 0.037 | 64.0  | 0.026 | 84.0  | 0.008 |
| 5.0   | 0.197 | 25.0  | 0.059 | 45.0  | 0.014 | 65.0  | 0.029 | 85.0  | 0.006 |
| 6.0   | 0.146 | 26.0  | 0.030 | 46.0  | 0.026 | 66.0  | 0.027 | 86.0  | 0.004 |
| 7.0   | 0.154 | 27.0  | 0.034 | 47.0  | 0.039 | 67.0  | 0.021 | 87.0  | 0.002 |
| 8.0   | 0.092 | 28.0  | 0.054 | 48.0  | 0.029 | 68.0  | 0.016 | 88.0  | 0.001 |
| 9.0   | 0.128 | 29.0  | 0.021 | 49.0  | 0.013 | 69.0  | 0.018 | 89.0  | 0.000 |
|       |       |       |       |       |       |       |       | 90.0  | 0.000 |

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**KMYU-D**

BLCDT-20021031ABG  
Latitude: 37-03-48.07 N  
Longitude: 113-34-23.16 W  
ERP: 3.20 kW  
Channel: 9  
Frequency: 189.0 MHz  
AMSL Height: 965.0 m  
Elevation: 958.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: Yes  
Elec Tilt: 0.75  
Prop Model: Longley-Rice  
Climate: Cont temperate  
Conductivity: 0.0050  
Dielec Const: 15.0  
Refractivity: 311.0  
Receiver Ht AG: 10.0 m  
Receiver Gain: 0 dB  
Time Variability: 90.0%  
Sit. Variability: 50.0%  
ITM Mode: Broadcast

**KMYU - Ch 9****3.2 kW - 57 m HAAT****POPULATION by Signal****>100 dBu = 0****>80 dBu = 86,628****>60 dBu = 127,709****>Principal Community****43 dBu = 148,712****>Noise Limited****36 dBu = 150,452**

**KMYU-A**

DTV Pet-21

Latitude: 37-03-47.93 N

Longitude: 113-34-25.84 W

ERP: 250.00 kW

Channel: 21

Frequency: 515.0 MHz

AMSL Height: 965.0 m

Elevation: 948.89 m

Horiz. Pattern: Omni

Vert. Pattern: Yes

Elec Tilt: 0.75

Prop Model: Longley-Rice

Climate: Cont temperate

Conductivity: 0.0050

Dielec Const: 15.0

Refractivity: 311.0

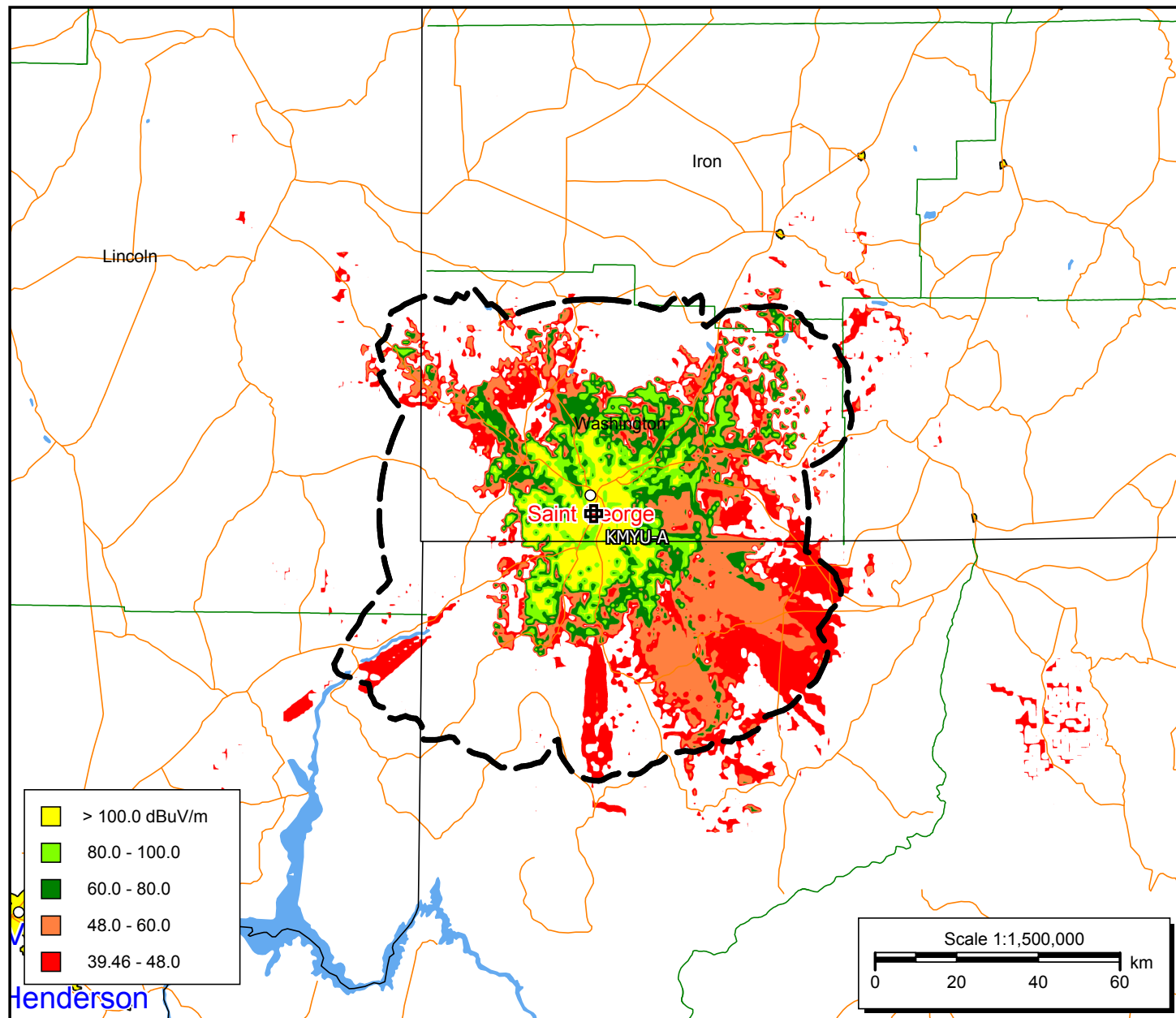
Receiver Ht AG: 10.0 m

Receiver Gain: 0 dB

Time Variability: 90.0%

Sit. Variability: 50.0%

ITM Mode: Broadcast

**KMYU - Ch. 21****250 kW - 57 m HAAT****POPULATION by Signal****>100 dBu = 86,293****>80 dBu = 109,570****>60 dBu = 137,365****>Principal Community****48 dBu = 149,771****>Noise Limited****39.46 dBu - 158,454**



# KMYU - ST. GEORGE, UTAH

## NOVEMBER 2020

### APPENDIX B

### Longley-Rice Interference Analysis

tvstudy v2.2.5 (4uoc83)  
Database: localhost, Study: KMYU 21 250kW OMNI 43H, Model: Longley-Rice  
Start: 2020.11.19 10:42:38

Study created: 2020.11.19 10:42:38

Study build station data: LMS TV 2020-11-19

Proposal: KMYU D21 DT APP ST. GEORGE, UT  
File number: KMYU 21 250kW OMNI 43H  
Facility ID: 35822  
Station data: User record  
Record ID: 1346  
Country: U.S.  
Zone: II

Search options:  
Non-U.S. records included  
Baseline record excluded if station has CP

Stations potentially affected by proposal:

| IX | Call    | Chan | Svc | Status | City, State        | File Number     | Distance |
|----|---------|------|-----|--------|--------------------|-----------------|----------|
| No | KBLR    | D20  | DT  | LIC    | PARADISE, NV       | BLANK0000058879 | 173.4 km |
| No | KEJT-CD | D21  | DC  | LIC    | SALT LAKE CITY, UT | BLANK0000059449 | 417.0    |
| No | KSNV    | D22  | DT  | LIC    | LAS VEGAS, NV      | BLANK0000112809 | 173.7    |

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D21  
Latitude: 37 3 48.00 N (NAD83)  
Longitude: 113 34 26.00 W  
Height AMSL: 965.0 m  
HAAT: 43.0 m  
Peak ERP: 250 kW  
Antenna: Omnidirectional  
Elev Pattn: Generic

39.5 dBu contour:

| Azimuth | ERP    | HAAT    | Distance |
|---------|--------|---------|----------|
| 0.0 deg | 250 kW | -57.6 m | 52.8 km  |
| 45.0    | 250    | 114.9   | 70.2     |
| 90.0    | 250    | -14.8   | 52.8     |
| 135.0   | 250    | 91.4    | 67.1     |
| 180.0   | 250    | 79.0    | 65.1     |
| 225.0   | 250    | 121.0   | 70.8     |
| 270.0   | 250    | 6.2     | 52.8     |
| 315.0   | 250    | 115.2   | 70.2     |

Database HAAT does not agree with computed HAAT  
Database HAAT: 43 m Computed HAAT: 57 m

Distance to Canadian border: 1326.5 km

**Appendix B - Interference Analysis**  
**KMYU - St. George, Utah**  
**Channel 21 - 250 kW - Page 2**

Distance to Mexican border: 494.1 km

Conditions at FCC monitoring station: Douglas AZ  
 Bearing: 148.7 degrees Distance: 715.3 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
 Bearing: 62.3 degrees Distance: 798.2 km

No land mobile station failures found

Study cell size: 2.00 km  
 Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%  
 Maximum new IX to LPTV: 2.00%

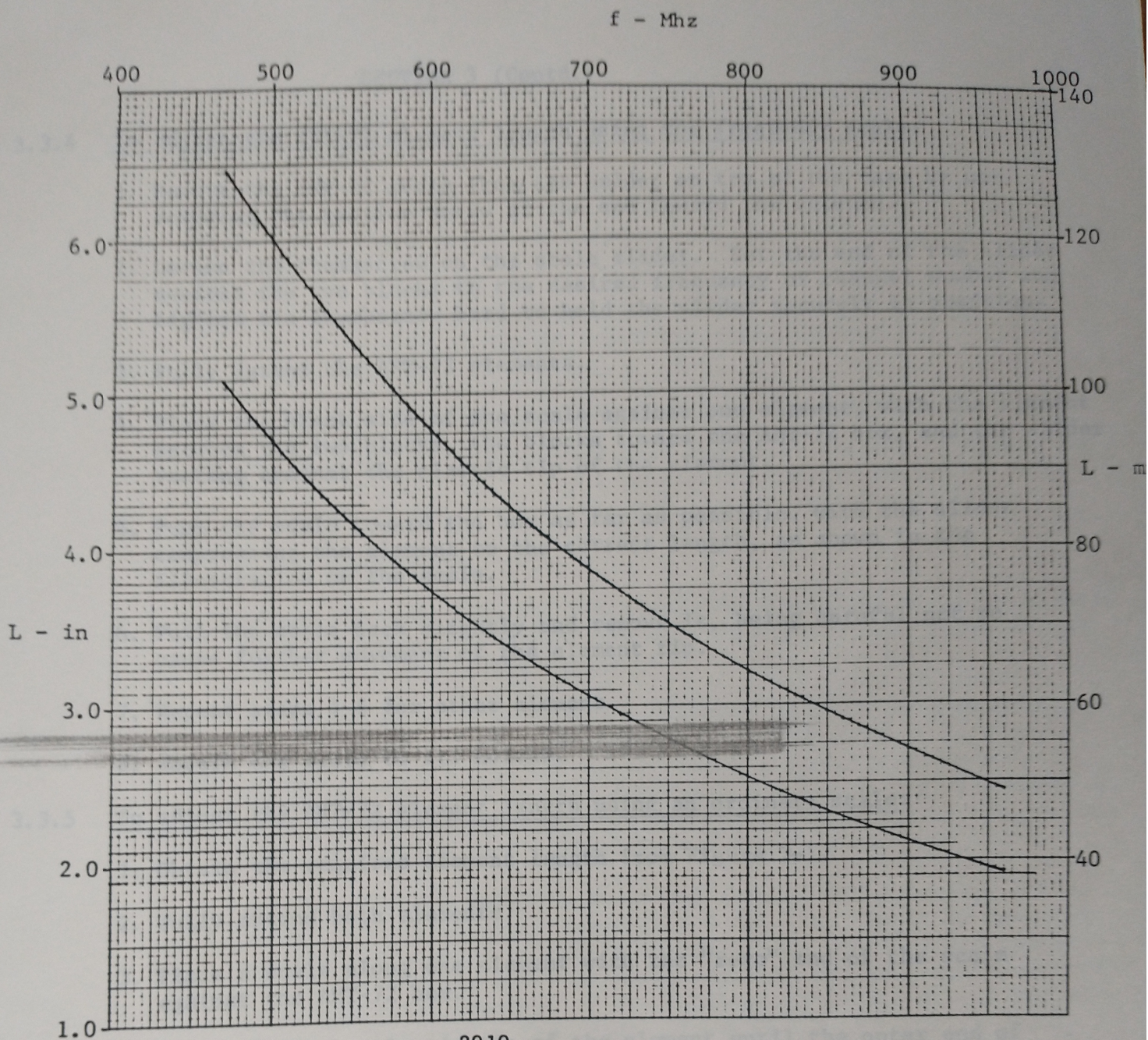
-----  
 Interference to proposal scenario 1

|          |      |      |     |        |                |                        |          |
|----------|------|------|-----|--------|----------------|------------------------|----------|
|          | Call | Chan | Svc | Status | City, State    | File Number            | Distance |
| Desired: | KMYU | D21  | DT  | APP    | ST. GEORGE, UT | KMYU 21 250kW OMNI 43H |          |

|         |              |        |                 |        |         |      |            |
|---------|--------------|--------|-----------------|--------|---------|------|------------|
|         | Service area |        | Terrain-limited |        | IX-free |      | Percent IX |
| 13048.4 | 165,358      | 9054.6 | 144,781         | 9054.6 | 144,781 | 0.00 | 0.00       |

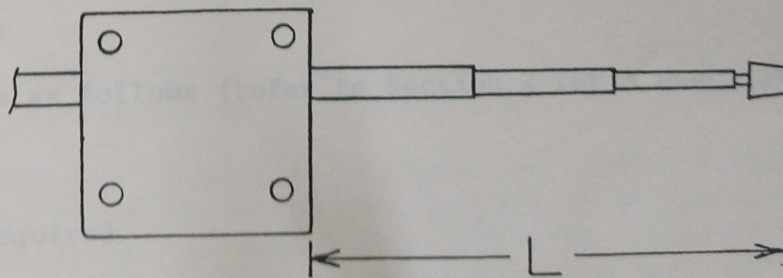
# ANTENNA PERFORMANCE CHARTS





Formulas for curves:  $L = \frac{2910}{f} - 1.10$  f in Mhz, L in inches

$L = \frac{73,914}{f} - 27.9$  L in millimeters



Antenna Element Length vs. Frequency

Figure 3-1



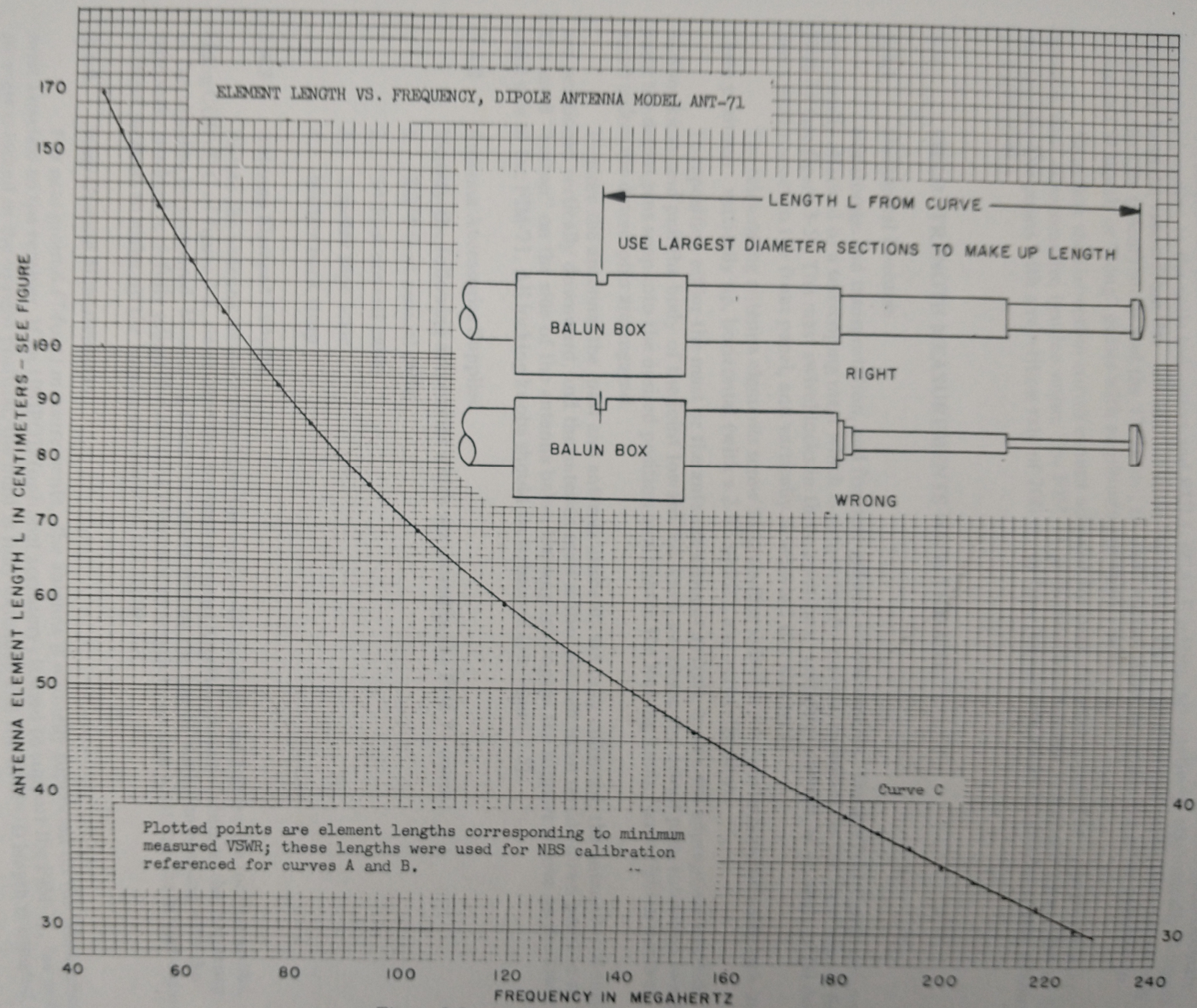


Figure 3-3. Antenna Factors, Curve C